

For: ELECTRIC FIELD CONTROL MATERIAL

Remarks begin on page 2 of this paper.

Application No. 10/591,622
Reply Dated August 4, 2010
Reply to Office Action Dated March 4, 2010

Remarks

Claims 1-20 are pending.

Claims 1-20 are submitted herein for review.

No new matter has been added.

In the Office Action, the Examiner has continued the rejection of claims 1, 12 and 20 under 35 U.S.C. under 35 U.S.C. 102(b) as being anticipated by Mitchnick et al (U.S. Patent No. 5770216). The reasons for the continued rejection were set forth in paragraph 6 of the Office Action. Applicant respectfully disagrees with the Examiner's assertion and submits the following remarks in response.

Independent claim 1 is directed to an electric field control material including a polymer matrix in which is dispersed a so-called non-linear filler having non-linear electric resistance properties, wherein the non-linear filler includes at least 97% by weight of zinc oxide as a homogeneous powder, and less than 3% by weight of at least one metal oxide as traces.

This arrangement of a non-linear type filler with its corresponding non-linear electric resistance properties provides an electrical field control material which is less expensive and is produced less restrictively than other prior electric field control materials, while providing a significantly improved breakdown resistance. See paragraph [0009]. See also paragraphs [0013] and [0018].

Applicant begins by noting that not all zinc oxide is the same. Some zinc oxide has linear

properties and some has non-linear properties. These zinc oxides are not simply interchangeable, particularly in view of the electrical property considerations of the present application.

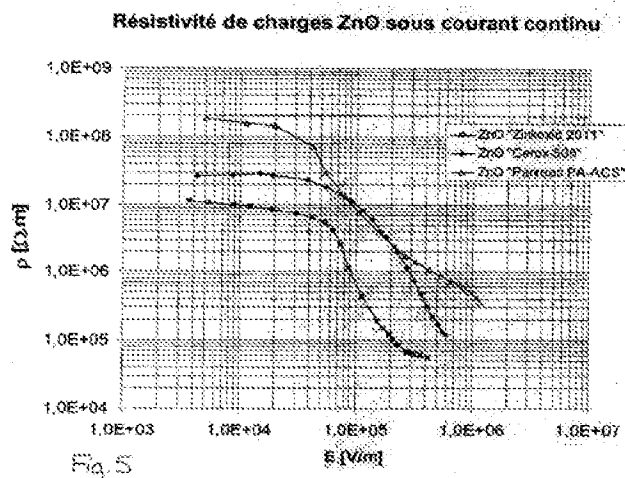
For example, in continuing the rejection, the Examiner wrote in paragraph 6 that:

“The filler in Mitchnick et al. *is compositionally the same as that claimed*. Since non-linear electric resistance property is associated with the particle and since the particles in the prior art and the claim appear to be the same, the properties would have to be present in the material of Mitchnick et al [...] As such it would be the corresponding, comparable filler in the prior art that provides the non linear properties.”

It appears that the Examiner is arguing that because the Mitchnick reference teaches zinc oxide then it inherently teaches that the filler has non-linear electric resistance properties. This is not correct.

As noted in the prior Amendment, Mitchnick does not have any disclosure on the nature of zinc oxide particles. In other words, Mitchnick does not teach whether the zinc oxide particles are linear or non-linear and thus there is no disclosure on whether they have linear or non-linear electric resistance properties. However, this is an important feature of the claimed arrangement.

For example, Figure 5 of the present specification shows the relationship between the conductivity and the direct current electric field, of three zinc oxide fillers. In view of the curves of Figure 5, said three fillers have non-linear electric resistance properties. This is an example of the claimed arrangement.

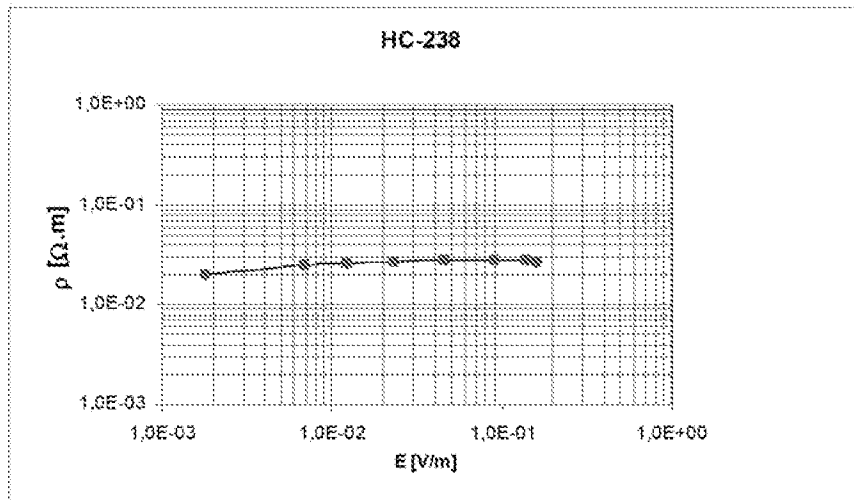


During the measuring step, each powder (sample according to the present claims) was submitted to variable electric voltages, and the corresponding current values were successively recorded after a stabilization time of 60 seconds. The values of the electric field and of the resistivity are obtained by a simple calculation which uses the thickness of the compressed powder layer and the surface of the electrodes.

In the graph of FIG. 5, the strongly non-linear behavior and the relatively low resistivity versus the electric field $\rho=f(E)$, for the "Zinkoxid 2011" powder used for making sample 7, are seen. See paragraph [0103] and [0104].

On the contrary, there are many zinc oxide fillers which have linear electric properties. By way of example, please see the attached data sheet for a zinc oxide filler ("HC-238" from Horsehead Corp.) including 99.3% by weight of zinc oxide. The relationship between the conductivity and the direct electric field of HC-238 is shown in

the following graph:



Thus, Mitchnick does not disclose a material characteristic of the present claims, namely the non-linear filler having non-linear electric resistance properties. Thus, there is no disclosure in Mitchnick that the filler can act as an electric field control material. Moreover, the Mitchnick reference does address this particular problem at all, namely the use of the filler as an inexpensive electrical field control material, so there is no need to selectively use non-linear zinc oxide (with non-linear electric resistance properties) in Mitchnick.

As such, the cited prior art does not teach or suggest all of the elements of claim 1. For example, the cited prior art of Mitchnick does not teach or suggest an electric field control material including a polymer matrix in which is dispersed a so-called non-linear filler having non-linear electric resistance properties.

In view of the foregoing, Applicant respectfully submits that pending claims 1-20 are in condition for allowance, the earliest possible notice of which is earnestly solicited. If the

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Examiner feels that an interview would facilitate the prosecution of this Application she is invited to contact the undersigned at the number listed below.

Respectfully submitted,

SOFER & HAROUN, L.L.P.

By /Joseph Sofer/.....

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Dated: August 4, 2010



HORSEHEAD CORP.

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MONACA, PA 15061
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FAX: 724-773-2226



MSDS FOR ZINC OXIDE: HC-238

ZC-X009

SECTION I - GENERAL INFORMATION

NAME: ZINC OXIDE

MANUFACTURER:
HORSEHEAD CORP.
300 Frankfort Road
Monaca, PA 15061
724-774-1020

TRANSPORTATION EMERGENCY:
CHEMTREC: 800-424-9300

CHEMICAL FAMILY: Nonferrous Metal Oxide

CAS NO.: 1314-13-2

FORMULA: ZnO

DOT HAZARD CLASS: Not listed **UN NO.:** NAIF* **NA NO.:** NAIF*

SARA SECTION 313: This product is subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act and 40 CFR 372. The materials underlined below are present in quantities above the applicable de minimis concentrations and are listed as Toxic Chemicals in 40 CFR 372.65.

ISSUE DATE: 2/12/88

REVISION DATE: 1/18/05

* NAIF - No applicable information.

SECTION II - INGREDIENTS

<u>MATERIAL</u>	<u>CAS NO.</u>	<u>%</u>
<u>ZINC OXIDE</u>	1314-13-2	99.3
<u>ALUMINUM</u>	7429-90-5	0.05
<u>CADMIUM</u>	7440-43-9	0.005
<u>LEAD</u>	7439-92-1	0.002

LEAD AND CADMIUM ARE INHERENT IN THE MANUFACTURE OF ZINC AND ARE NOT PHYSICALLY ADDED IN THE MANUFACTURE OF ZINC OXIDE.